

Book Review

書評

“Louder than words: The new science of how the mind makes meaning”

Bergen, B. K., Basic Books (2012)

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ABSTRACT

This paper examines Benjamin K. Bergen’s book, “Louder than words: The new science of how the mind makes meaning.” Using cognitive linguistic experiments and neuropsychology, Bergen explains the action-sentence compatibility effect paradigm, that is, how the brain uses the areas that control movement to process language and create meaning. In so doing, he gives good examples of research into how the brain creates language and how this research is supported by neurobiology.

KEYWORDS: Book review, Cognitive linguistics, Neurolinguistics, ELF practices

1. STARTING POINT

Bergen (2012) states that philosophers have contemplated the interaction of thinking and language for hundreds of years. Bergen starts his book by questioning a paradigm that had been held by many philosophers for hundreds of years until the 1970’s. Until that time, theorists had held that people thought using a mental language referred to as mentalese. In the 1970’s, the idea that the meaning of words might be based in experiences began to gain approval. Put in simple terms, a word is defined by all the physical experiences a person has with the thing the word represents. For example, one might define pizza by the way it looks, tastes, smells, how it feels in one’s hand or mouth, who one eats it with, when they eat it, and where they eat it. However, there were two logical flaws with this. Bergen (2012) researches where the symbols for experience come from and what creates them.

2. ACTION-SENTENCE COMPATIBILITY EFFECT

Bergen (2012) presents the reader with the action-sentence compatibility effect paradigm and location-sentence compatibility effect paradigm. He puts forward the notion that the brain compares memories with the verb and location words of a sentence and creates a mental simulation that is compatible with those aspects of the sentence.

3. METHOD

How can you observe the mind creating meaning? According to Bergen (2012), you use high-speed cameras, buttons, knobs, a “gripasaurus” to record reactions and reaction time using computers, data analysis software and then back up your findings with functional magnetic resonance imaging. In cognitive linguistics, researchers sometimes start with an existing theory and add to it or think of a new one based on an old one, then they create experiments to test the theory using the above equipment, and then turn to neurobiology theories to interpret the results (Schumann, 2004). This is what Bergen does in his experiments.

Bergen starts by explaining both cognitive theory and the primary motor cortex. Second, he explains his and other researcher’s experiments that measure the actions of the primary motor cortex by looking at reaction times using computers. Third, he analyzes the results, backs them up with mental imaging, and, finally, he interprets the results.

The brain uses grammar in real time to assemble and reassemble simulations as new lexical information is encountered. According to Bergen (2012), this is both a top down and bottom up process with both happening simultaneously and then the results are compared with world knowledge. People start incrementally with the first couple of words of a sentence but quickly create large simulations that may need to be changed as they get more information and near the end of a sentence. For one example he gives evidence that the same sentence in English and Japanese is processed differently due to the grammar of the two languages using the sentences “Nana put the egg in the fridge,” and “Nana put the egg in the pan,” and in Japanese “nana-ga reezooko-nonakani tamago-o ireta” and “Nana-ga furaipan-nonakani tamago-o ireta” (Nana fridge-inside egg put, and Nana pan-inside egg put).

4. BERGEN’S CRITICISMS

Like any scientific endeavor, Bergen’s (2012) theories and experiments are open to criticism. Toward the end of his book, he puts forward these possible criticisms: What is simulation good for? Is it peripheral to thought or does it just happen without any connection to the thought process and therefore has no effect on creating language? Could the results of the experiments be due to fatigue or memory delay? These criticisms, if proved to be true, could make his conclusions irrelevant. In his rebuttal, Bergen presents these criticisms as obvious problems with the research.

While he does discuss interesting ways they have been tested, he says the results are inconclusive because the variables cannot be separated. He then turns to work with head trauma victims and momentarily induced brain lesions using Transcranial Magnetic Stimulation (TMS) in an effort to give further evidence of the connection between meaning and simulation (Shergill et al., 2002). He relates research in which areas of the brain associated with location are impaired using TMS, which uses a mild magnetic pulse to momentarily knock out neurons. As a result, participants lost the ability to use prepositions of location correctly (Aziz-Zaden et al., 2005). While this is a nice addition to the action-sentence effect, the location-sentence effect, he seems to side step around the criticisms by giving more evidence in support of the action-sentence effect.

5. BERGEN'S CONCLUSIONS

Bergen (2012) argues that simulation in language comprehension helps people to identify words and the sense in which they are being used. He hypothesizes that the evolutionarily newer parts of the brain that are responsible for creating and understanding language draw on the resources of older parts of the brain and use them in a new way to create simulations. Bergen believes that the work being done by himself and other researchers has gone a long way to explain the cognitive process that underlie comprehension. However, about the research into how the mind creates meaning in general, Bergen states:

We've only just arrived at the foot of the mountain. We still don't know exactly what embodied simulations are doing, functionally, for meaning. We still don't know exactly how meaning differs when simulation differs. And, we still don't know whether we can make meaning without simulating. We don't know the answers, but we do know that these are good questions. (p. 248)

Bergen puts his research into perspective with a common caveat in neurology based research, that is, researchers do not know exactly what is happening in the brain, but he has provided a step towards that understanding and proposed important avenues of inquiry to gain a better understanding of how the mind creates meaning.

6. APPLICATION TO LANGUAGE TEACHING IN THE ELF CLASSROOM

This reviewer would put forward that teachers can use the information from Bergen's book to choose teaching methods, better understand students, and to help the students make connections with new material. According to Bergen (2012), there

is a lot of neural variation among learners. Schumann (2004) says that this is even more so among language learners past the critical period of language acquisition. Wittrock (1992) believes that the key to learning a language for students is how they generate meaning and relate new information to experiences. And, Wittrock suggests that students be taught how to do this, be given opportunities to practice, and encouragement to do it on their own. It has long been held that having students relate new lexical items to their interests and experiences generates more learning and more durable retention (Nation, 2001; Vansteenkiste, Lens & Deci, 2006; Wittrock, 1991). Looking at how individuals use experiences and simulations to create meaning, Bergen offers a neurobiological reason for this long held pedagogical practice.

Cultural norms and discourse structures may be different to some degree in different communities around the world and this can limit understanding. In the English as a Lingua Franca classroom it is important to encourage students to imagine the situations they encounter in readings, listening exercises and when communicating in English. This not only helps students to activate schemata, but, based on Bergen's book, may help their comprehension. While imagination is generally an internal process, task-based projects can be used to promote students' imagination practice and provide the teacher with some evidence that the students are in fact exercising their powers of imagination. Students could write stories to fit a dialogue, or act out dialogues or texts. Simpler exercises to scaffold up to bigger projects could be information gap activities such as pairing dialogues or texts with a scenario, scene or description of an event. These could be made even simpler for the students by using activity sheets where students make choices or fill in blanks based on a given dialogue or scene. In many ways these activities are similar to reading comprehension activities. However, as opposed to the goal of increasing comprehension, the goals are sharpening and displaying imagination, which might later lead to greater comprehension.

7. CONCLUSION

In this review, Bergen's starting point for his research, his view of the brain, his research methods, his initial experiments, his future research, criticisms and his conclusions, all from his book, have been introduced. Also, possible ways teachers in the ELF classroom may benefit from Bergen's neurobiological research were offered. This review gives only a superficial view of Bergen's book. While Bergen firmly places his and other researcher's theories and work in current neurobiological and neurolinguistics research, he does not provide much in the way of the historical development of this area of study. Schumann's (2004) "The neurobiology of learning" was turned to for a better understanding of its progression. How Bergen's work corresponds to other research using aspects of neurolinguistics would also be welcomed. Bergen does provide detailed explanations of his theories and research that are as informative as they are interesting.

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